WHAT IS CLAIMED IS:

1. A bandpass amplifier for use in a communication system having a transmit band and a receive band associated therewith, comprising:

a frequency selective network for noise shaping an input signal, the frequency selective network comprising first filtering circuitry for selectively passing the transmit band, and second filtering circuitry for selectively passing the receive band, the first and second filtering circuitry being configured to effect suppression of energy associated with the transmit band in the receive band;

an analog-to-digital converter coupled to the frequency selective network;

a switching device coupled to the analog-to-digital converter for producing an output signal; and

a feedback path for feeding back the output signal to the frequency selective network to facilitate the noise shaping.

2. The bandpass amplifier of claim 1, wherein the first filtering circuitry comprises at least one transmit band resonator operable to resonate at the transmit band, and the second filtering circuitry comprises at least one receive band resonator operable to resonate at the receive band.

3. The amplifier of claim 2, wherein the at least one transmit band resonator and the at least one receive band resonator are configured to maximize a dynamic range associated with the amplifier.

4. The bandpass amplifier of claim 2, wherein at least one of the transmit band and receive band resonators comprises a transconductive element, an inductive element, and a capacitive element.

5. The amplifier of claim 4, wherein the capacitive element comprises a bank of capacitors for tuning the corresponding resonator.

6. The bandpass amplifier of claim 1, wherein the frequency selective network comprises:

a first signal path including a first number of transmit band resonators operable to resonate at the transmit band, and a second number of receive band resonators operable to resonate at the receive band; and

a second signal path including a third number of transmit band resonators operable to resonate at the transmit band, and a fourth number of receive band resonators operable to resonate at the receive band; wherein

a difference between the first and third numbers is equal to or less than two; and

a difference between the second and fourth numbers is equal to or less than two.

7. The bandpass amplifier of claim 6, wherein the first and second signal paths have at least one of the receive band resonators in common.

8. The bandpass amplifier of claim 7, wherein the first, second, third, and fourth numbers are one, three, one, and two, respectively.

9. The bandpass amplifier of claim 6, wherein the first signal path is a feedforward path, and the second signal path is a feedback path.

10. The bandpass amplifier of claim 9, wherein the feedforward path includes a transmit band resonator, and the feedback path includes two receive band resonators.

11. The bandpass amplifier of claim 6, wherein the first and second signal paths are differentially driven.

12. The bandpass amplifier of claim 6, wherein at least one of the first and second signal paths have at least one feedforward path coupled thereto.

13. The bandpass amplifier of claim 12, wherein the at least one feedforward path includes a coefficient element.

14. The bandpass amplifier of claim 6, wherein the feedback path includes a coefficient element.

15. The bandpass amplifier of claim 6, further comprising:

a signal generator for applying a signal to a selected one of the first number of transmit band resonators, the second number of receive band resonators, the third number of transmit band resonators, and the fourth number of receive band resonators;

a peak detector for detecting a signal strength of the signal passed through the selected one; and

control circuitry for adjusting the selected resonator to maximize signal pass rate of the selected resonator at the corresponding one of the transmit and receive bands.

16. The bandpass amplifier of claim 15, wherein

the control circuitry is further operable to receive information representing the transmit band, calculate the receive band based on the information, and adjust the first number of transmit band resonators, the second number of receive band resonators, the third number of transmit band resonators, and the fourth number of receive band resonators to maximize signal pass rate at the corresponding one of the transmit and receive bands.

17. The bandpass amplifier of claim 1, further comprising:

a signal generator for applying a signal to a selected one of the first filtering circuitry, and the second filtering circuitry;

a peak detector for detecting a strength of the signal passed through the selected filtering circuitry; and

control circuitry for adjusting the selected filtering circuitry to maximize signal pass rate of the selected filtering circuitry at the corresponding one of the transmit and receive bands.

18. The bandpass amplifier of claim 17, wherein the control circuitry is further operable to

receive information representing the transmit band;

calculate the receive band based on the information; and

adjust the first filtering circuitry and the second filtering circuitry to maximize signal pass rate at the transmit band and the receive band, respectively.

Fig 3, 5, 6

19. A communication system having a bandpass amplifier having a transmit band and a receive band associated therewith, comprising:

a frequency selective network for noise shaping an input signal, the frequency selective network comprising first filtering circuitry for selectively passing the transmit band, and second filtering circuitry for selectively passing the receive band, the first and second filtering circuitry being configured to effect suppression of energy associated with the transmit band in the receive band;

an analog-to-digital converter coupled to the frequency selective network;

a switching device coupled to the analog-to-digital converter for producing an output signal; and

a feedback path for feeding back the output signal to the frequency selective network to facilitate the noise shaping.

20. The communication system of claim 19, wherein the first filtering circuitry comprises at least one transmit band resonator operable to resonate at the transmit band, and the second filtering circuitry comprises at least one receive band resonator operable to resonate at the receive band.

21. The communication system of claim 20, wherein the at least one transmit band resonator and the at least one receive band resonator are configured to maximize a dynamic range associated with the amplifier.

22. The communication system of claim 20, wherein at least one of the transmit band and receive band resonators comprises a transconductive element, an inductive element, and a capacitive element.

23. The communication system of claim 22, wherein the capacitive element comprises a bank of capacitors for tuning the corresponding resonator.

24. The communication system of claim 19, wherein the frequency selective network comprises:

a first signal path including a first number of transmit band resonators operable to resonate at the transmit band, and a second number of receive band resonators operable to resonate at the receive band; and

a second signal path including a third number of transmit band resonators operable to resonate at the transmit band, and a fourth number of receive band resonators operable to resonate at the receive band; wherein

a difference between the first and third numbers is equal to or less than two; and

a difference between the second and fourth numbers is equal to or less than two.

25. The communication system of claim 19, wherein the first and second signal paths have at least one of the receive band resonators in common.

26. The communication system of claim 19, further comprising:

a signal generator for applying a signal to a selected one of the first filtering circuitry, and the second filtering circuitry;

a peak detector for detecting a strength of the signal passed through the selected filtering circuitry ; and

control circuitry for adjusting the selected filtering circuitry to maximize signal pass rate of the selected filtering circuitry at the corresponding one of the transmit and receive bands.

27. The communication system of claim 26, wherein the control circuitry is further operable to

receive information representing the transmit band;

calculate the receive band based on the information; and

adjust the first filtering circuitry and the second filtering circuitry to maximize signal pass rate at the transmit band and the receive band, respectively.

28. The communication system of 27, wherein the control circuitry is further operable to receive information representing the transmit band from a base station.

29. The communication system of claim 28, wherein the receiving, the calculating, and the calibrating are performed before a user of the communication system initiates a communication with the base station.

30. The communication system of 19, wherein the communication system and the base station communicate with each other using frequency division duplex mode.

1034 31. The communication system of claim 19, wherein the transmit band is lower than the receive band by about 45 MHz.

1034 32. The communication system of claim 19, wherein the transmit band ranges from about 824 MHz to about 849 MHz, and the receive band ranges from about 869 MHz to about 894 MHz.

33. The communication system of claim 27, wherein the control circuitry is further operable to

select a filter which is to be calibrated among the first and second filtering circuitry;

apply a signal to the selected filter;

detect a strength of the signal which passes through the selected filter; and

adjust the selected filter in response to the strength.

34. The communication system of claim 33, wherein the control circuitry is further operable to modify capacitance associated with the selected filter.

35. The communication system of claim 34, wherein the control circuitry is further operable to selectively couple at least one of a plurality of capacitors provided in the selected filter; and wherein a variation in the signal strength is determined by comparing a plurality of signal strengths corresponding to different values of the capacitance.

36. The communication system of claim 33, wherein the control circuitry is further operable to cut off electric power supplied to the plurality of the filters except the selected filter.

Fig 5 37. A method of calibrating a bandpass amplifier having a transmit band and a receive band associated therewith, the bandpass amplifier including first filtering circuitry for selectively passing the transmit band and second filtering circuitry for selectively passing the receive band, comprising:

receiving information representing the transmit band;

calculating the receive band based on the information and a frequency offset between the transmit band and the receive band; and

adjusting the first filtering circuitry and the second filtering circuitry to maximize signal pass rate at the transmit band and the receive band, respectively.

38. The method of claim 37, wherein the information representing the transmit band is obtained from a base station.

39. The method of claim 37, wherein the receiving, the calculating, and the adjusting are performed before initiating a communication with the base station.

40. The method of 37, wherein the communication system and the base station communicate with each other using frequency division duplex mode.

(103) 41. The method of claim 37, wherein the transmit band is lower than the receive band by about 45 MHz.

(103) 42. The method of claim 37, wherein the transmit band ranges from about 824 MHz to about 849 MHz, and the receive band ranges from about 869 MHz to about 894 MHz.

43. The method of claim 37, wherein the adjusting includes:

selecting a filter which is to be calibrated among the first and second filtering circuitry;

applying a signal to the selected filter;

detecting signal strength of the signal which passes through the selected filter; and

tuning the selected filter in response to the signal strength.

44. The method of claim 43, wherein the tuning comprises modifying capacitance associated with the selected filter.

45. The method of claim 44, wherein the modifying includes selectively coupling at least one of a plurality of capacitors provided in the selected filter; and wherein a variation in the signal strength is determined by comparing a plurality of signal strengths corresponding to different values of the capacitance.

46. The method of claim 43, wherein the selecting includes cutting off electric power supplied to the plurality of the filters except the selected filter.

47. A bandpass amplifier for use in a communication system having a transmit band and a receive band associated therewith, comprising:

a means for selecting frequency comprising first filtering circuitry for selectively passing the transmit band, and second filtering circuitry for selectively passing the receive band, the first and second filtering circuitry being configured to effect suppression of energy associated with the transmit band in the receive band;

a means for analog-to-digital converting coupled to the means for selecting frequency;

a means for switching coupled to the means for analog-to-digital converting for producing an output signal; and

a feedback means for feeding back the output signal to the means for selecting frequency to facilitate the noise shaping.